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In re application of
Mika Perälä et al.

Serial No. 10/019,962
Filed July 4, 2000

Art Unit: 1712
Examiner: Jeffrey B. Robertsson

COMPOSITION TO BE USED IN PAINTS

DECLARATION

I, Mika Perälä, Master of Science in Chemical Engineering, being employed from February 23, 1998 as a R&D Chemist in NOR-MAALI OY in Finland and being one of the inventors of the invention described and claimed in the subject patent application, depose and state the following facts with respect to the non-obviousness of the composition to be used in paints of the present invention as regards.

Comparative tests were carried out using binder system based on the patent of Kuriyama et al (Example 10) and the binder system made in accordance with present invention.

Binder by Kuriyama et al (Example 10)

To bisphenol A type epoxy resin (Epikote 828, 100 parts by weight) is added dibutyl tin dilaurate (0,5 part by weight), and to the mixture are added liquid hydroxyl-terminated, linear polydimethylsiloxane (Silopren C 1, 30 parts by weight) and 3-glycidoxypolytrimethoxysilane (Silquest A-187, 1 part by weight) with stirring. The mixture is heated (+80°C) for 6 hours. The epoxy resin thus obtained is a milky white liquid. The composition has a viscosity of 32 000 cP.

Binder by present invention

To non-aromatic epoxy resin (Epodil 757, 100 parts by weight) is added liquid methoxy-functional polysiloxane (Dow Corning 3074, 116,5 parts by weight) and 3-glycidoxypolytrimethoxysilane (Silquest A-187, 20,6 parts by weight) with stirring. The binder thus obtained is clear liquid. The composition has a viscosity of 64 cP.

Curing

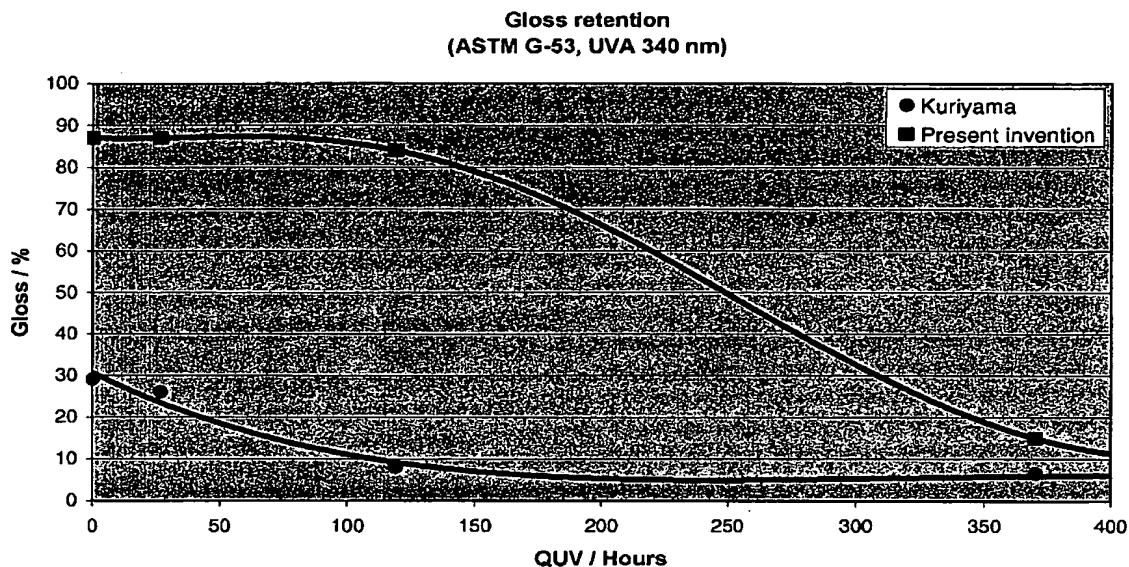
Both binders obtained with procedures mentioned before were cured with a modified aliphatic polyamine mentioned in patent by Kuriyama (Ancamine 1784) and the hardener described in example 3 in present invention.

Curing of the epoxy resin obtained by Kuriyama was very slow with modified aliphatic polyamine. After 96 hours curing in 23°C and 48 hours stoving in 50°C the paint film was still sticky. Also the surface of the coating was greasy. After mixing with the hardener by present invention a lot of agglomeration occurred and it was impossible to apply the coating.

The binder obtained by present invention was cured with modified aliphatic polyamine with same procedure. After 96 hours curing in 23°C and 48 hours stoving in 50°C the paint film was cured and not sticky like the binder by Kuriyama. Combination with the hardener by present invention gave cured paint film after 72 hours.

UV-resistance

Weathering test for the coatings in question was made with the QUV accelerated weathering tester according to standard ASTM G-53 (UVA 340 nm). The gloss retention of the binders cured with a modified aliphatic polyamine is shown in the picture 1. The UV-resistance of the paint films obtained with the hardener described in example 3 in present invention was not measured because the binder by Kuriyama did not combine with it.



Picture 1. Gloss retention of binders cured with modified aliphatic polyamine.

Conclusion

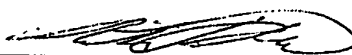
Composition to be used in paints made by present invention differs from the resin obtained by Kuriyama with the procedure how the resin part is made. In other words reaction with elevated temperature and catalyst is not needed. In present invention the silanol functionality is not necessary in organopolysiloxane. Methoxy-functional polysiloxane used in present invention can not be comprised of the formula of an organopolysiloxane by Kuriyama. Use of organosilane is limited to epoxysilane in present invention. In the patent of Kuriyama there are no limitations for the organosilane compound. Also the viscosities of the compositions are in totally different range. If a pigmented paint is made from resin by Kuriyama it has to be thinned with solvents. The paint made by present invention can be manufactured and also applied by spraying without adding any solvents.

Curing properties of the resin by Kuriyama differs considerably from the binder by present invention with the hardener mentioned by Kuriyama (modified aliphatic polyamine). In practice binder with such curing properties is not useful for paint purposes.

UV-resistance is better with the composition by present invention according to the weathering test. This is one of the main issues of the present invention of the composition to be used in paints.

I further hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, both, under §1001 of Title 18 of the United States Code and that such wilful statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 03.03.2004


Mika Perälä